GSAS v3.6 Release Notes
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Introduction

GSAS 3.6 is a major release which contains fixes and adds significant functionality for L1A, Atmosphere, Waveform, and Elevation processes and products. Additional functionality was incorporated into GLAS_Meta.

For L1A, the following changes were made:

Updated GLA01 to match new CCR-006 telemetry formats.

Fixed possible duplication of L1A records at granule seams.

Added laser/detector sensitivity to energy calculations i.e. allowed different calibration constants depending on which laser or detector is on.

GLA04 BST time computation now uses data latency.

Fixed a problem where GLA01 i_gainSet1064 was not being correctly handled as an unsigned value.

For Waveforms, the following changes were made:

Standard fit fine tuned to fit leading edge better

Previous releases were processing returns which had no leading or trailing edge. For release 12, these measurements will not be processed since there is no way to accurately calculate a valid range if the return walked off the front or back of the telemetered window.

Standard fit requires minimum of 30 ns between peaks –merges peaks closer than this into same Gaussian

Standard fit uses observed values of noise and corresponding standard deviation to calculate threshold for signal instead of calculating the noise from the waveform – causes some "bad" returns to be processed compared with release 3.5

Error fixed that caused many good waveforms to not have fits in release 11 (3.5). All good near-Gaussian returns appear to have Gaussian fits

Significant improvement in saturated WF fits

Flags added to mark separately high and low gain saturation

Flag added to mark high gain saturation with large amount of forward scattering based on waveform shape, gain, and amplitude only, not measured atmosphere

Bug fixed that caused negative sigma values

Wfqual flag corrected – should agree with documentation

Received energy all, is now calculated from all energy above the threshold instead of just from the maximum peak – this will affect reflectance.

The transmitted energy is now calculated for each shot when calculating reflectance in W_Assess.

The high frequency GPS time correction, beam co-elevation, and beam azimuth values on release 11 (GSAS 3.5) were truncated at 0 instead of allowing them to go negative – this was fixed. The GPS time correction was used correctly internally (in Release 11) so the orbit interpolation was still at the correct time.

Transmit waveforms are now being fit where before they were not due to a too stringent check on the width. – did not affect range measurement because that was based on the centroid and not the Gaussian fit.

Computational problem corrected in GLA05 which prevented negative values from appearing in the deltagpstmcor, beam_azimuth, and beam_coelev values. As these values are pass-throughs to GLA06 and 12-15, the problem also appeared there.

For Elevation processes, the following changes were made:

Tidal values – The tidal values on release 11 products (GSAS 3.5) were applied with the wrong sign. They were also applied to the slant range before the elevation was calculated. Release 12 (GSAS 3.6) now calculates the elevation without correcting the range for the tides and then applied them to the resultant elevation with the correct sign.

The specific range offset used to calculate the elevation on each region l2 product is output on the product.

Flags fixed – should reflect documentation (surface flag is now in the correct order)

Saturation and forward scattering flags brought forward to elevation products in rng_uqf

Saturation flag removed from elvflg – put in rng_uqf

The troposphere correction is now corrected for off-nadir attitude and new coefficients were used in the calculation – should see very minimal (mm) differences due to coefficient change. For larger off-nadir attitudes will see cm differences due to slant range correction

Reflectance changes:

- o optical transmission change from .555 to .67 based on BCE measurements and analysis of reflectance – reflectance values will change accordingly

- o reflectance now calculated using individual transmit pulses instead of one transmit pulse/sec – did not remove oscillation but changed values slightly

The units on GLA12-15 for the standard deviation of the fit to the data did not allow for enough significant digits, they have been changed to millivolts.

The slope and roughness are no longer invalid for the narrow returns. The equation to calculate these use the sigma of the impulse response and this was incorrectly input as 4 ns instead of the 1.7 ns used in release 12.

For Atmosphere, the following changes were made:

The atmosphere calibration file was modified to handle larger values/more precision.

Other, more general fixes include:

Several flag definitions were changed/updated.

Production documentation was updated/fixed.

Significant changes were made to the browse products.

Metadata files were updated to work with ESDT changes.

QAP processing was enhanced.

Product Format/Definition Change Summary

GLA01:

Updated to match new GLAS Flight S/W CCR-006 telemetry formats. The GLA01 format for the short and long record has been changed. The record length is the same but the spares at the end of the records now contain gainStatus, NumCoinc, rawPkHt.

Correction made to i_instState PDF, bit 19, changing Primary to Secondary. Change the product database for GLA01_Main, i_instState, invalid=i4b to invalid=no.

GLA01, GLA04_01

i_txWfPk_Flag documentation has been corrected.

GLA04_05

variables i_bst1_BG and i_bst2_BG have been updated to: Unsigned = No, Prod Min = -32767, Prod Max = 32767.

variables i_bst1_datlat and i_bst2_datlat. Prod Units chg to Microseconds and Alg Scale chg to 1.0D-6

GLA05

i_MaxRecAmp, product units=Tenth of millivolts, algorithm scale= 1.0d-4

variables i_gval_tx and i_gval_rcv were changed to invalid value "NO"

Changed bit definitions in wfqual on GLA05

Changed descriptions of i_parm1 & i_parm2

GLA05, 06, 12-15

i_MaxSmAmp, product units= Tenth of millivolts, algorithm scale= 1.0d-4

i_reflctuncorr now a common parameter

PADPoint description has been modified

GLA06, 12-15

> Changed i_corrStatFlg from (2) to (3) on gla06, 12-15. Defined a bit in i_corrStatFlg to indicate that a default value for the optical depth was used to calculate the atm correction to the reflectance.

> Removed the saturation bit from elvflg (bit 7). Put saturation bit info into i_rng_UQF on GLA06 and GLA12-15.

GLA12-15

> GLA12:i_IceSVar, GLA13: i_SeaIceVar, GLA14: i_LandVar, GLA15: i_OceanVar have been updated with the Prod Units: millivolts, Alg Units: volts, Alg Scale: 1.00E-03 and new description.

> Specific range offsets used to calculate elevation put on each product replacing signal end.

The latest product formats/descriptions will be available at http://glas.wff.nasa.gov/v36_products/.

Known Problems

Release 12 made significant improvements in fitting the Gaussians to the return for the standard parameterization when the return was not significantly spread due to slopes or roughness. !However, wide noisy returns may now have worse fits than for release 11. !When the fit is bad the roughness and slope calculated from it are erroneous. !On each of the higher level elevation products there is a variable that gives the standard deviation of the functional fit to the raw waveform. !The variable names are: GLA12- i_IceSVar; GLA13-i_SeaIceVar, GLA14-i_LandVar, GLA15-i_OceanVar. !When these values are larger than normal, it infers that the functional fit does not fit the waveform well and therefore the slope and roughness calculations are suspect.

For narrow waveforms, the slope and roughness are undefined even though the Gaussian fit is good.

GLA04 QAP is not processed.

GLA16 is still not ready for production.

Elevation processing must still include ANC08 and ANC09 as inputs.

Due to some data errors on GLA04_05, more records are now being deleted due to overlapping (or exact) times.

The Ball Star Tracker time tag algorithm was modified to correctly use the internal time tag. Normally this is .12xxx seconds; however whenever there are duplicate data the time tag is .22yyy. This can yield exact duplicate time or an approximate duplicate time to the millisecond level. The duplicate time edit is currently on an exact time repeat so the cases of millisecond differences are not edited.

Release Information

The ClearCase label for this release is RELEASE_3.6.

The release date is August 28, 2003.

Version numbers have been updated to "V3.6 August 2003" for the following:

       all libraries

       GLAS_L1A

       GLAS_Alt

       GLAS_Atm

       GLAS_Meta

       anc07_00

       anc07_01

       anc07_02

       anc07_03

       anc07_04

       anc07_05

       anc45_01-15

This should be verified during operation by checking the version information in the appropriate ANC06 files.

SMDS Impact

The distribution tarfile is on glasdev.wff.nasa.gov at the following location:

```
/glasdev1/v3/dist/gsas_V3.6.tar.Z.
```

ANC Files

       New versions of all the ANC07, ANC45 and ANC46 data files are required.

Planner Rules

       Elevation planners should use ANC08/ANC09 as inputs.

Compilation

       All libraries and binaries should be recompiled using the top-level Makefile. **IMPORTANT: due to internal changes in the makefiles, SDMS MUST use the command "make runtime" to ensure the software is made without debug flags.**

       The process for making the libraries and binaries is as follows (**NOTE: SDMS ONLY!!**)

```
cd /install_dir/gsas_v3.6
make runtime
make install
```

       Note : developers should not use the above procedure. This procedure is for SDMS only!

Detailed Change Notes

AI0000102 : Create a Utility to put GLA16 in HDF Format

Modified ANC45 files to be more consistent with NSIDC MCF files.

Modified File I/O routines to accept ANC48 and ANC49 (MCF files).

Modified I/O routines to accept GLA16.

Renamed toupper.f90 to gsas_toupper.f90 to avoid a namespace collision with HDFEOS. Changed all routines which called toupper.f90 appropriately.

Added StartOrbitNumber and StopOrbitNumber to common_hdr_mod. Commented-out constant NOSE start/stop blocks. Revised instrument_state change code.

Added "type=None" capability to openfinfile and openfoutfile.

PR0000199 : GLAS_Alt elevations crashes when running with certain control settings

Checks were added to the code so as to error gracefully if there is a problem with the ANC04 file.

AI0000252 : BST background conversion incorrect?

From the science team: The background count should be treated as signed. A negative count means that the tracker has been light saturated for a longer period of time and because the reference voltage is dynamic, can result in a negative output-this data can be ignored but nonetheless recorded as such.

Code was changed to reflect that the BST background count is a signed number.

The product database documentation for GLA04-05, variables i_bst1_BG and i_bst2_BG has been updated to: Unsigned = No, Prod Min = -32767, Prod Max = 32767 and the Comment was added from Paul Woznick: The background count should be treaded as signed. A negative count mean that the tracker has been light saturated for a longer period of time and because the reference voltage is dynamic, can result in a negative output.

PR0000265 : Fitted peak width is occationally negative

In W_LsqFit_mod, the fitting proccess occationally recommends a negative peak sigma.

PR0000296 : GLA05 QAP Problems in Release 9

The following has been done:

1) spare01 is now set to gi_invalid_i4b.

2) & 3) W_GetAsQAStats & W_BuildTrkStats were being called in the wrong order in W_CreQAStats_mod.

4) i_hstnInitPks(:,:,2:5) are now set.

5) dQA_100DCent & iQAhstDeltaCnt now use the maxAmp peak instead of the last peak.

6) limits for i_hstDeltaCnt have changed from [0,100] to [-50,50]

7) limits for i_hstNInitPks have changed from [0,6] to [0,50].

8) The error near line 1118 in W_Assess_mod has been fixed. There might be more places that need fixing for this problem.

9) Calculations for i_pcntNoFit, i_pcntNoSig, & i_pcntXSat now use NINT.

CR0000349 : Define Another bit in i_corrStatFlg

Defined a bit in i_corrStatFlg to indicate that a default value forthe optical depth was used to calculate the atm correction to the reflectance.

Changed ElevMgr to set i_corrStatFlg(3) (stored as bit 4 on products), and to pass i_corrStatFlg through from GLA06 to GLA12-15..

Changed i_corrStatFlg from (2) to (3) on gla06, 12-15.

Changed funpk_CorrStatFlg & fpk_CorrStatFlg to handle (3).

AI0000359   : Change Documentation for i_corrStatFlg on gla06,12-15

Changed i_CorrStatFlg, algorithm dimension from 2 to 3. Changed the PDF of i_CorrStatFlg by adding bit 4 with new definitions.

CR0000369 : sigma att definition inconsistent with documentation and code

Code now matches documentation in the ICD and sets sigmaatt flag accordingly using a small finite set of integer flag values rather than a continuum range.

CR0000370   : dry trope correction needs to have path angle correction included

The trop corrections have been scaled to account for path angle.

CR0000372 : saturation flag needs to be set based on new criteria

Saturation flag is now set based upon the triple criterion that:

a) Gain <= 13

b) pulse amplitude > 220

c) echo pulse energy > 15 fJ

CR0000377 : changes in elvflg to account for saturation and max peak used in ht calc

GLA05 - set bit 7 in elvflg when wfqual saturation bit is set set bit 6 everywhere indicating "other" algorithm used to calculate elevation no other bits should be set for GLA05

GLA06, GLA12, GLA13, GLA14

set bit 7 when wfqual saturation bit is set

set bit 5 indicating "Gaussian with largest peak used"

no other bits should be set

GLA14, set bit 1 indicating "centroid for alternate parameterization"

(this should already be set)

set bit 7 when wfqual saturation bit is set

The reference in the previous bug note 5-28-03 should refer to GLA06, GLA12, GLA13,and GLA15 as a group. GLA14 is mentioned below those as a special case.

CR0000384   : QAPG updates for GLA03,04, Release 10

See Items 419 and 427.

AI0000388   : check out the coefficents being used by GSAS in trop calculations

The K1, K2 refractive index coefficients were changed to 0.7866385, and 0.6644364 K/bar in the trop correction calculations.

AI0000396   : Waveforms needs to use new GLA01 Transmit quality flag to detect bad Tx waveform

WFMgr uses GLA01%i_txFlg (Transmit quality flag) to detect when the transmitted pulse is bad and then sets GLA05%l_wfQual(gwi_noTrPulse,:). ElevMgr checks for l_WFqual(gwi_noTrPulse,:).

Added check for i_TxFlg

Added check for l_WFqual(gwi_noTrPulse,:)

Added l_isRecWF (=True when received WF, False when transmitted pulse) to various subroutines so they will check the appropriate l_wfQual flags.

PR0000418 : i_surftype has bits 4-7 set instead of bits 0-3

There were several problems with surftype flag (now corrected); however, the description of the errors in this Bug report were inaccurate. The code had been changed so that the common_flags modules were bypassed. All scal_mod modules have been changed and the common_flags module has been brought up to speed for the surftype flag from antiquated internal code that was in place. There was also a mis-assignment problem by bit in the ElevMgr_mod.

CR0000419 : QAPG updates for Gla06,12-15

Comparison of Release 11 and modified results:

GLA06

. Max amp of raw wf a-t data -- d_maxSmAmp.

The scale factor was changed between Release 11 and now (Mantis 449). The current values are x100 lower than they should be, consistent with this scale change.

. N final peak histogams -- i_numPk -- differ between QAPG and L2 output GLA12, 14 appear to be the same.

I suspect changes somewhere in the production software constants files between the time of the Release 11 run and the time of the QAPG run.

. Dry trop bar -- d_dtrop -- and other bars on GLA12-15 have different # points. Some have different values.

I suspect changes somewhere in the production software constants files between the time of the Release 11 run and the time of the QAPG run.

GLA12

. Max amp of raw wf a-t data -- d_maxSmAmp: see GLA06.

. N final peak histogams -- i_numPk -- differ. GLA 12, 14 appear to be the same: see GLA06.

. GLA06 dry trop bar -- d_dtrop -- and other bars on GLA12-15 have different # points. some have different values: see GLA06.

GLA13

. Max amp of raw wf a-t data -- d_maxSmAmp: see GLA06.

. GLA06 dry trop bar -- d_dtrop -- and other bars on GLA12-15 have different # points. some have different values: see GLA06.

. A-T Surf rough: L2 - no good data. QAPG - good data. How can this happen?

 I suspect changes somewhere in the production software constants files between the time of the Release 11 run and the time of the QAPG run.

GLA14

. Max amp of raw wf a-t data -- d_maxSmAmp: see GLA06.

. N final peak histogams -- i_numPk -- differ. GLA 12, 14 appear to be the same: see GLA06.

. GLA06 dry trop bar -- d_dtrop -- and other bars on GLA12-15 have different # points. some have different values: see GLA06.

GLA15

. Max amp of raw wf a-t data -- d_maxSmAmp: see GLA06.

. QAPG is not computing elev wrt ellipsoid for GLA15. Why not? Check the elev code to see if this can be done. If it cannot be done, need to change flag set in qapg_prodinit.

For now, QAPG_ProdInit changed to indicate N/A.

. GLA06 dry trop bar -- d_dtrop -- and other bars on GLA12-15 have different # points. some have different values: see GLA06.

PR0000426 : In WFMgr_mod, some WFQual flags are set for every shot but shouldn't be.

resolved as part of Item 0000372, based on instructions from L.Roberts and J.Guerber

PR0000427 : qapg_gla05_at.f90 compares logical variables to 0

There is also one place in qapg_gla05_sum.f90 where the same logical is compared to 1.

This bug will be fixed on branch PR310, where qapg is being modified to add code to generate qap files for GLA03 and GLA04. See Mantis 384.

CR0000429 : Alg Structures Should Not Be Accessed Directly In W_Assess

test results to show that moving required GLA01 and GLA05 variables to calling sequence makes no difference

CR0000443 : add new keywords to anc09 processing for indexed degradations

Indexed degradations in addition to time-referenced degradations are now processed by software under brnach cr443. ICD modifications have been submitted.

CR0000444 : Ball Star tracker data latency product scale change

The product database has been updated for GLA04-05, variables i_bst1_datlat and i_bst2_datlat. Prod Units chg to Microseconds and Alg Scale chg to 1.0D-6.

PR0000446 : No Fit For Some WFs

Resolved on branch pr471.

AI0000447 : Update .met processing for new

Updated ANC45 files to reflect ESDT descriptor revisions.

CR0000448 : product data base scale factor and units wrong for maxrecamp and maxsmamp

In the Product Database changed the following:

GLA05, i_MaxRecAmp, product units=Tenth of millivolts, algorithm scale= 1.0d-4

GLA05, i_MaxSmAmp, product units= Tenth of millivolts, algorithm scale= 1.0d-4

i_MaxSmAmp is also changed in GLA06, GLA12-15

PR0000449 : Scale Factor For i_maxSmAmp is wrong for GLA06, 12-15

Only minor repairs required to scale values for d_maxSmAmp. Verification on glasdev under /glasdev1/flight_data/elv_20030315/sfm/zz_maxsmamp.

PR0000450 : The GSASV3.5 elevation manager can only be run with the intrpPOD option set

Elevations can now be run without the ANC08 file as input. The interpPOD flag is no longer required to be set to run.

CR0000455 : GLA04-lrs possible duplicated data at granule seams

The main aim of this CR was to consistently use the individual shot time for granule boundary comparisons (as opposed to the less-precise input time). This means that granules boundaries now truly respect the start/stop times defined in the control file.

However, the reorganization of the L1AMgr necessitated by this change has generated a lot of impact. Here is a list of the (other) major changes:

L1AMgr reorganized from 1300+ lines of code to 600+ lines of code.

Used LPA d_UTCTime as granule boundary master time for ALL GLA04 QA.

Code now structured such that the granule synchronization is done AFTER precise time is computed. QA code had to restructured likewise.

The i_time_txWFPk code did not respect the possibility that not all AD Science packets are present. This was fixed.

Moved instrument state checks into own module.

Removed a significant amount of extraneous code. A lot of "IF" test could've been combined.

QA routines are run only if the appropriate QAP file is open.

Found possible podFlg problems. Initialized PODflg, bit 4, to 2.

Fixed problem where GLA03 AT QA interval was 16sec. Now is 3600 sec.

The selection of LPA as the master time to set granule boundaries leads to some of the GLA04s qap summary data such as IST and LRS which do time alignments to shots to be a few seconds short in the granules statistics. The actual granules contain the proper data. This is caused by the fact that there is only one QAP file per granule and the end of one file of the mutli-files needs to force the granule stat wrapup.

CR0000460 : QABrowse update for Release 11

In addition to updating the code, old .pro modules that were in /glas/vob/idl/qa_browse and /glas/vob/idl/util were removed, and the /glas/vob/idl/util directory was removed. Util is now a subdirectory of qa_browse.

PR0000461 : Only one peak is removed in doAgainLoop in W_Estimates

This corrects a typo that prevented W_Estimates from removing more than one undesirable peak.

The line "doAgain = .TRUE." was inserted into the loop "doAgainLoop".

PR0000464 : incorrect values for i_txWfPk_flag

The product database description and the flag PDF for i_txWfPk_Flag has been changed in GLA01_main and GLA04_LPA_main.

PR0000471 : The Fitting Process Always Keeps The Last Peak

Removed unneeded arguments in call to W_Assess.

Removed code in W_FunctionalFt that kept the last peak. Modified W_Estimates to calculate sigma for the max-amp peak from the width of the WF at 80% of max-amp. Skipped new recalc of sigma for alternate parameters. Changed min sigma for fit of transmitted pulse from 2.5 to 0.8 so that narrow transmitted pulses will be fit. Corrected dimensions of variables associated with W_Estimates so that all peaks on the transmitted pulse are detected instead of just the first one(mantis 554).

Put debug prints in W_Assess. Removed arguments that were only used by W_LsqFit when the transmitted pulse was being fitted in W_Assess instead of W_FunctionalFt.

Added code to W_LsqFit that returns the reason that a peak should be removed (too small, too narrow, ...). Added debug prints to W_LsqFit that can be activated by turning on a global-to-waveforms flag. Corrected a bug in W_LsqFit that occationally produced negative peak widths (mantis 265).

Changed I_NSCAL2 from 1 to 0 so that the observed noise and standard deviation of the noise are used instead of being calculated (mantis 547).

PR0000473 : Problem With ANC07 Global Variables

on branch /main/gsfc_int/pr473:
/glas/vob/src/common_libs/platform_lib/const_wf_mod.f90
/glas/vob/src/common_libs/anc_lib/anc07_wf_mod.f90
/glas/vob/data/anc07_001_01_0004.dat
Removed d_dTHiRes.
/glas/vob/src/glas_alt/WFMgr_mod.f90
Changed d_dTHiRes to gd_dTHiRes.

on branch /main/WFF/wpr473:
/glas/vob/src/common_libs/anc_lib/anc07_glob_mod.f90
/glas/vob/src/common_libs/platform_lib/const_glob_mod.f90
/glas/vob/data/anc07_001_01_0001.dat
Added gd_dTHiRes. Changed gd_ThrPcnt from 0.03d0 to 0.1d0

/glas/vob/src/common_libs/anc_lib/anc07_l1a_mod.f90
/glas/vob/src/common_libs/platform_lib/const_l1a_mod.f90

/glas/vob/data/anc07_001_01_0005.dat
Removed d_ThrPcnt & d_dTHiRes.

/glas/vob/src/l1a_lib/L_Alt_mod.f90
Changed d_dTHiRes to gd_dTHiRes. Changed d_ThrPcnt to gd_ThrPcnt.

Ran L1A, WF's, and Elevations for branch pr473 + wpr473, and for the integration branch using anc07's with the same values. The products did not change.

CR0000477 : AtmMgr will not compile

Changes were made to AtmMgr_mod.f90 under item cr477. The compile issue created by a previous change under Item 443 has been alleviated. .

PR0000478 : Inconsistent/incorrect determination of end of QAP averaging period

New module containing FUNCTION PastEndOfPeriod, to be called by all processes generating along-track QAP records to determine when the record ends.

CR0000480 : The energy calculation needs to be laser/detector sensitive

Parameters d_calibCoefTr and d_calibCoefRec, used in calculation energy, are now laser/detector sensitive. We have reasonable values for detector 1, but no values for detector 2. The instrument team needs to provide values before any switch to detector 2.

Additionally, a problem was found where InstState flag had spares initialized to 1. The spares are now initialized to 0. Code was added to correctly set the Detector bits. These bits were previously documented, but code was not present to set them.

A minor error was corrected in the InstState PDF documentation. The InstState database entry was changed from invalid=i4b to invalid=no.

Correction made to i_instState PDF, bit 19, changing Primary to Secondary. Change the product database for GLA01_Main, i_instState, invalid=i4b to invalid=no.

PR0000481 : Likely incorrect invalid used for GLA01 i_ADdetOutGn, and doc inconsistency

The GLA05 variables i_gval_tx and i_gval_rcv were changed to invalid value "NO"

PR0000490 : QABrowse aborts when lat/lon points too close together

The code was changed to look for the point nearest to the test point rather than for a point within a specified distance of the test point.

CR0000492 : GLA12-15 fit variances have incorrect units and descriptions

All four variables are derived directly from GLA05 parameters, and have equivalent units and scale factors. Thus:

GLA05%d_wfFitSDev_2 (standard) --> d_IceSVar, d_SeaIceVar, d_OceanVar

GLA05%d_wfFitSDev_1 (alternative) --> d_LandVar

The units for algorithm parameters are volts, and the units for product parameters are millivolts. The algorithm scale factor is 0.001, as previously communicated.

Definitions can be copied from GLA05, so that "The standard deviation of the difference between the functional fit and the received echo using standard (or alternative) parameters".

The variables GLA12:i_IceSVar, GLA13: i_SeaIceVar, GLA14: i_LandVar, GLA15: i_OceanVar have been updated with the Prod Units: millivolts, Alg Units: volts, Alg Scale: 1.00E-03 and new description.

CR0000493 : GLA12-15 fit std dev fields don't have enough significant digits

The GLA12-15 fit stdev fields (d_IceSVar, d_SeaIceVar, d_LandVar, d_OceanVar) are now reported uniformly with product units of millivolts, and with improved precision.

PR0000498 : QABrowse problems

1. Was fixed by using all along-track records with good positions to define the x axis range for all plots.

2. Was fixed by modifications to the routine that defines the map space. Complete testing is not possible, as it would require input files covering all possible situations, but the changes worked better with the available data.

Other problems noticed while working on this PR:

3. Some of the plot titles still read "Last peak" when they should read "Highest Peak". The version is now used to determine what the title should be.

4. Some elevation plots had the line giving the time the plot was generated written twice, and some did not have it all. This was fixed by removing the duplicate call to the routine that was writing the time.

5. For files generated for special requests, the data density can be high enough that data for low values are covered by data for higher values on the ground track maps (low value points are plotted first). As a partial fix, the symbol size will be reduced if the number of points is too high. For the test GLA14 file, which had nearly 14,000 along-track points, the reduced symbol size seemed sufficient. I am not sure how to deal with this if the data density is so high that the smaller symbol size doesn't solve the problem.

PR0000499 : C_CalcRNrg Not Calculating d_RecNRGAll_EU Correctly

Error codes were added to L_Alt_mod, anc07_001_01_0000.dat, C_CalctNrg & C_CalcrNrg. The calculation of d_RecNRGAll_EU (GLA01 - Received Energy for All of Waveform) was corrected - in previous releases, d_RecNRGAll_EU had the same value as i_RecNrgLast_EU.

PR0000500 : Problem With Received Energy Calculation In L1A

Error codes were added to L_Alt_mod, anc07_001_01_0000.dat, C_CalctNrg & C_CalcrNrg. The calculation of d_RecNRGAll_EU (GLA01 - Received Energy for All

of Waveform) was corrected - in previous releases, d_RecNRGAll_EU had the same value as i_RecNrgLast_EU.

CR0000505 : GLAS_Atm fail on calibration file read

If calibration constant data is not available for the current time via anc36 files, processing continues and the 532 and 1064 calibration constants are set to the default values.

The 1064 calibration constant is always set to the default value regardless of the value of the flag gi_use_gcc_f. This was done because experience with real 1064 data has shown that it is impossible to calculate the 1064 calibration constant from the atmosphere and we will always need to use the default value determined by other means.

In order to fix the problem of the program bombing when there are no anc36 data for the current granule, the error severity code associated with the -40026 error must be changed from 3 to 2. This is in the anc07. ... .0000.dat file.

The read problems that initiated this CR were the result of atm_anc writing invalid values (largest number a double can hold) to the ANC36 file. When GLAS_Atm tried to read this file, it would generate an I/O error. This forced changing the ANC36 file from a formatted ascii file to a binary unformatted file.

CR0000506 : BALL Star tracker (BST) Sample time is incorrect

The sample_time computation for GLA04_05 (BST) data was changed. The appropriate bst_datalat value is now subtracted from the bst1/bst2 sample_times.

Due to some data errors on GLA04_05, more records are now being deleted due to overlapping (or exact) times.

CR0000508 : the external GLA04 time latency values need to be updated

The GLA04_06 (position/attitude) packet sample_time external latency was changed from 0.0 to 0.0000015D0. This changes the GLA04_06 sample_time by +0.0000015D0 seconds.

PR0000512 : Release 11 QAP05 along-track data not set

QAP05 along track data is now valid.

PR0000521 : QAPG for GLA08 cannot handle large flies

Temporarily, the array size for GLA08 QAPG was changed to 30,000. A more permanent change should be made -- the GLA08 calculations should use onepass_average_mod, which will eliminate the need for keeping the individual values around.

CR0000522 : clicking i_reflctuncorr on GLA05 shows only on 05, but is also on l1b and l2

Changes made to the Product Database on 7/25/03, 08:00.
Changed i_reflctuncorr to be a common parameter of GLA05, GLA06, GLA12, GLA13, GLA14, GLA15. Insured that the above fields were documented per leeanne bug notes.

CR0000534 : GLAS telemetry format change FSW CCR-016

Modified GLA01 product and L1A processing code to handle new GLAS Flight S/W CCR-006 Telemetry format.

The GLA01 format for the short and long record has been changed. The record length is the same but the spares at the end of the records now contain gainStatus, NumCoinc, rawPkHt. See GLA01 updated product description.

CR0000545 : redefine current saturation bit in higher level products and add new ones

Release Notes:

Changed bit definitions in wfqual on GLA05 as follows:
bit 22 - saturation flag set - low gain situation
Gain<=13cts, WFAmplitude>220cts, d_RecNrgAll_EU>15.0d-15j
where WFAmplitude is the maximum amplitude.
bit 23 - saturation flag set - high gain situation
Gain>=250cts, d_RecNrgAll_EU<10.0d-15j, pkWidth>20.0ns
where pkWidth is the gaussian sigma in i_parm2 for the last or closest-to-the-satellite peak.
bit 24 - saturation (high gain situation) and forward scattering
Gain>=250cts, d_RecNrgAll_EU<10.0d-15j, pkWidth>20.0ns, skew2>0.9

Removed the saturation bit from elvflg (bit 7).
Put saturation bit info into i_rng_UQF on GLA06 and GLA12-15.
bit 12 =1, range measurement may be inaccurate due to saturation at low gain (same as wfQual bit 22)
bit 13 =1, range measurement may be inaccurate due to saturation at high gain (same as wfQual bit 23)
bit 14 =1, range measurement may be inaccurate due to saturation at high gain and significant forward scattering (same as wfQual bit 24)

CR0000547 : I_NSCAL2 in anc07_0004 Should be Changed

Fixed on 471

CR0000549 : The Documentation For GLA05%i_parm1 & GLA05%i_parm2 Needs Updating

Descriptions changed 07/24/03, Changes made per description in the Product Database of the variables i_parm1 and i_parm2 in GLA05.

The Description section of the documentation for i_parm1 & i_parm2 in gla05 changed to:

 (i_parm1)
"Parameters (in physical units) determined from the fit of the received echo using the alternative parameterization. In the order of: item1=noise (millivolts), then 6 sets of three Gaussian parameters (subitem1=amplitude (millivolts), subitem2=peak location (ns), and

subitem3=sigma (ns)). Items 2-4 are the Gaussian parameters for the last (closest-to-the-ground or 1st) peak. Items 5-7 are the Gaussian parameters for the next-to-last (2nd) peak. ... Items 17-19 are the Gaussian parameters for the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set invalid. Adding the location to i_refRng gives the two-way range in time to the center of that peak."

(i_parm2)
"Parameters (in physical units) determined from the fit of the received echo using the standard parameterization. In the order of: item1=noise (millivolts), then 6 sets of three Gaussian parameters (subitem1=amplitude (millivolts), subitem2=peak location (ns), and subitem3=sigma (ns)). Items 2-4 are the Gaussian parameters for the last (closest-to-the-ground or 1st) peak. Items 5-7 are the Gaussian parameters for the next-to-last (2nd) peak. ... Items 17-19 are the Gaussian parameters for the closest-to-the-satellite peak. If there are fewer than six peaks, the unused parameters are set invalid. Adding the location to i_refRng gives the two-way range in time to the center of that peak."

PR0000554 : transmit pulse fitting problem
Fixed on branch pr471 - see mantis 0000471.

PR0000563 : tidal values have been applied with wrong sign to elevations on GLA06, 12-13
For Release 12, the spot location is calculated using a range corrected for tropospheric delay, internal range bias, and external range bias. The tides are then applied to the resultant elevation.

Release 11 had the tides applied with the wrong sign to the range before the spot location and elevation were calculated.

PR0000590 : C_CalcNrg uses GLAS_Error but does not return errorseverity
Error codes were added to L_Alt_mod, anc07_001_01_0000.dat.

CR0000597 : Metadata QA parameter name changes
Changes to the anc45 12-15 files are listed below.

/glas/vob/data/anc45_001_01_0012.dat
Previous ----------->Current
Elevation Data------>Surface Elevation
Laser Reflectance---->Surface Reflectance
Roughness--------->Surface Roughness
Slope-------------->Surface Slope

/glas/vob/data/anc45_001_01_0013.dat
Previous-------------->Current
Laser Roughness------->Surface Roughness
Elevation Data --------->Surface Elevation

Roughness------------>REMOVED

/glas/vob/data/anc45_001_01_0014.dat
Previous------------------>Current
Digital Terrain Elevation Data->Surface Elevation
Roughness---------------->Surface Roughness
Slope-------------------->Surface Slope
Laser Reflectance----------->Surface Reflectance

/glas/vob/data/anc45_001_01_0015.dat
Previous-------------->Current
Elevation Distribution--->Surface Elevation
Roughness------------>Surface Roughness
Reflectance------------>Surface Reflectance
Sea Surface Height------>REMOVED

CR0000623 : remove mention of pole tide from PAD description

Updated the Product Database description for the variable i_PADPoint in GLA05, GLA06, GLA12, GLA13, GLA14, & GLA15. Removed the sentence "This also includes the effect of the pole tide." from the description.

CR0000632 : Set metadata QA

Changes to the anc45 files and testing were done on Branch 597 along with changes from that mantis item.

Note: In the Mantis description for this item, AutomaticQualityFlag has to be set to Suspect, there is no Inferred Passed allowed for this item. The only choices for AutomaticQualityFlag are Passed, Failed and Suspect. The Automatic,Operational, and Science Quality Flag Explanation can be anything of our choosing within the 255 character limit.

Changes to anc45 files were as such

AutomaticQualityFlag = Suspect (changed from Passed to Suspect)
OperationaQualityFlag = Inferred Passed (no change here)
ScienceQualityFlag =Failed (changed from Inferred Passed to Failed)

-added explanation of suspect to automaticqualityexplanation.

AutomaticQualityFlagExplanation = Passed indicates parameter passed for specific automatic test; Suspect, QA not run; Failed, parameter failed specific automatic test.

PR0000649 : makefile for atm_anc needs -lmath

Added -lmath as requested. (immediate integration-branch check-in)

PR0000662 : WF Fit is Worse on Some Wide Noisy Peaks

Added d_maxGoodsDev to anc07_001_01_0004.dat, const_wf_mod.f90, anc07_wf_mod.f90, and l_FunctionalFt_mod.f90. For standard parameters, passing second estimate for the maximum-amplitude peak location and width to W_PerformFit. W_PerformFit tries the fit again using the second set of estimates if the first fit standard deviation was greater than d_maxGoodsDev. If the second fit standard deviation is larger, then the first fit parameters are kept.

PR0000664: relectance calculation should use transmit energy calcualted from each shot

The transmitted energy is now calculated for each shot (instead of once per second) when calculating reflectance in W_Assess. d_gainTr is passed from WFMgr to W_Assess. C_CalcTNrg is called by W_Assess.

AI0000671 : optical transmission change from .555 to .67

Changed optical transmission calibration value from 0.555 to 0.67.

PR0000674 : i_gainSet1064 is not treated correctly as an unsigned.

Fixed a problem where i_gainSet1064 was not being correctly handled as an unsigned value.

CR0000676 : ECS reported that some changes to .MET not acceptable

Several typos in the .met files were detected by ECS. These were subsequently corrected.

PR0000680 : Inadventent filtering of negative values in GLA05 words

Computational problem corrected in GLA05 which prevented negative values from appearing in the deltagpstmcor, beam_azimuth, and beam_coelev values. As these values are pass-throughs to GLA06 and 12-15, the problem also appears there.

PR0000688 : no leading edge and no trailing edge and no signal defined incorrectly

The code that sets the flags gwi_noLeadEdg1, gwi_noLeadEdg2,gwi_noTrlEdg1, gwi_noTrlEdg2, gwi_noSig1, & gwi_noSig2 in GLA05%l_WFqual has been corrected. W_FunctionalFt checks these flags before trying to fit the WF.

CR0000709 : Spare2 listed twice in GLA09

Renamed spare3, offset 3988 to spare4 & renamed spare2, offset 242 to spare3 in GLA09 documentation.

CR0000720 : change d_nsig2 on anc07 waveform file to not process just noise

For standard fit d_nsig2 was increased from 8.0 to 15.0. This is used to determine signal threshold as a multiplier of the standard deviation of the noise. In release 12 for the

standard parameterization we changed to use the observed values of the mean and standard deviation of the noise instead of calculating the values. The observed values are from the background and will always be less than or equal to the noise region of the telemetered return. Therefore the constants used to calculate the signal thresholds had to be raised also.

Changed Files:

../data/anc07_001_01_0001.dat
./data/anc07_001_01_0002.dat
./data/anc07_001_01_0003.dat
./data/anc07_001_01_0004.dat
./data/anc07_001_01_0005.dat
./data/anc45_001_01_0001.dat
./data/anc45_001_01_0002.dat
./data/anc45_001_01_0003.dat
./data/anc45_001_01_0004.dat
./data/anc45_001_01_0005.dat
./data/anc45_001_01_0006.dat
./data/anc45_001_01_0007.dat
./data/anc45_001_01_0008.dat
./data/anc45_001_01_0009.dat
./data/anc45_001_01_0010.dat
./data/anc45_001_01_0011.dat
./data/anc45_001_01_0012.dat
./data/anc45_001_01_0013.dat
./data/anc45_001_01_0014.dat
./data/anc45_001_01_0015.dat
./idl
./idl/qa_browse
./idl/qa_browse/ReleaseNotes.txt
./idl/qa_browse/browse
./idl/qa_browse/browse/definebar.pro
./idl/qa_browse/browse/qab01.pro
./idl/qa_browse/browse/qab01_lowerlevelplots.pro
./idl/qa_browse/browse/qab01_nselectedchart.pro
./idl/qa_browse/browse/qab01_upperlevelplot.pro
./idl/qa_browse/browse/qab01_writetabletoplot.pro
./idl/qa_browse/browse/qab02.pro
./idl/qa_browse/browse/qab02_groundtrackmap.pro
./idl/qa_browse/browse/qab02_lowerlevelplots.pro
./idl/qa_browse/browse/qab02_plottable.pro
./idl/qa_browse/browse/qab02_upperlevelplot.pro
./idl/qa_browse/browse/qab02_writetabletoplot.pro
./idl/qa_browse/browse/qab03.pro
./idl/qa_browse/browse/qab03_alongtrack.pro

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./idl/qa_browse/browse/qab03_extractbardata.pro
./idl/qa_browse/browse/qab03_findn.pro
./idl/qa_browse/browse/qab03_getlimits.pro
./idl/qa_browse/browse/qab03_summary.pro
./idl/qa_browse/browse/qab04.pro
./idl/qa_browse/browse/qab04_alongtrack.pro
./idl/qa_browse/browse/qab04_atxtickrange.pro
./idl/qa_browse/browse/qab04_barspage1.pro
./idl/qa_browse/browse/qab04_barspage2.pro
./idl/qa_browse/browse/qab04_histograms.pro
./idl/qa_browse/browse/qab04_lpaandlrsimages.pro
./idl/qa_browse/browse/qab04_summary.pro
./idl/qa_browse/browse/qab04_xtickrange.pro
./idl/qa_browse/browse/qab05.pro
./idl/qa_browse/browse/qab05_barplot.pro
./idl/qa_browse/browse/qab05_copystruct.old
./idl/qa_browse/browse/qab05_fileintegritycheck.pro
./idl/qa_browse/browse/qab05_fitstr.pro
./idl/qa_browse/browse/qab05_gndtrkmapclose.pro
./idl/qa_browse/browse/qab05_gndtrkmaps.pro
./idl/qa_browse/browse/qab05_groundtrackmaps.pro
./idl/qa_browse/browse/qab05_histograms.pro
./idl/qa_browse/browse/qab05_llplotsetup.pro
./idl/qa_browse/browse/qab05_lowerlevelplots.pro
./idl/qa_browse/browse/qab05_multiplot.pro
./idl/qa_browse/browse/qab05_plothist.pro
./idl/qa_browse/browse/qab05_plottable.pro
./idl/qa_browse/browse/qab05_upperlevelplot.pro
./idl/qa_browse/browse/qab05_wfcharstr.old
./idl/qa_browse/browse/qab05_writetabletoplot.pro
./idl/qa_browse/browse/qab06.pro
./idl/qa_browse/browse/qab06_gndtrkpage.pro
./idl/qa_browse/browse/qab06_lowerlevelplots.pro
./idl/qa_browse/browse/qab06_upperlevelplot.pro
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./idl/qa_browse/browse/qab09.pro
./idl/qa_browse/browse/qab10.pro
./idl/qa_browse/browse/qab11.pro
./idl/qa_browse/browse/qab13and15.pro
./idl/qa_browse/browse/qab13and15_lowerlevelplot.pro
./idl/qa_browse/browse/qab13and15_upperlevelplot.pro
./idl/qa_browse/browse/qab_addcolorbar.pro
./idl/qa_browse/browse/qab_alongtrackstatplot.pro
./idl/qa_browse/browse/qab_bar__define.pro
./idl/qa_browse/browse/qab_barchart.pro
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./idl/qa_browse/browse/qab_barchartstr.pro
./idl/qa_browse/browse/qab_getlatlon.pro
./idl/qa_browse/browse/qab_gndtrkmap.pro
./idl/qa_browse/browse/qab_histpanel.pro
./idl/qa_browse/browse/qab_mappanel.pro
./idl/qa_browse/browse/qab_nogooddata.pro
./idl/qa_browse/browse/qab_nonstdlatlonrange.pro
./idl/qa_browse/browse/qab_noplot.pro
./idl/qa_browse/browse/qab_outputfilename.pro
./idl/qa_browse/browse/qab_plot.pro
./idl/qa_browse/browse/qab_plotclose.pro
./idl/qa_browse/browse/qab_plotelevadjustments.pro
./idl/qa_browse/browse/qab_plotmap.pro
./idl/qa_browse/browse/qab_plotpanel.pro
./idl/qa_browse/browse/qab_plotrangeadjustments.pro
./idl/qa_browse/browse/qab_readcntlfile.pro
./idl/qa_browse/browse/qab_tripleplot.pro
./idl/qa_browse/browse/qab_tripleplotpage.pro
./idl/qa_browse/browse/qab_writeheadfoottoplot.pro
./idl/qa_browse/browse/qabelev_positions.pro
./idl/qa_browse/browse/qabrowse.pro
./idl/qa_browse/browse/qabrowse_userguide.txt
./idl/qa_browse/browse/qacolortable.pro
./idl/qa_browse/browse/runbrowse
./idl/qa_browse/browse/sample.txt
./idl/qa_browse/compare
./idl/qa_browse/compare/qapc_alongtrack.pro
./idl/qa_browse/compare/qapc_inprod_alongtrack.pro
./idl/qa_browse/compare/qapc_inprod_alongtrack_V3.pro
./idl/qa_browse/compare/qapc_inprod_summary.pro
./idl/qa_browse/compare/qapc_inprod_summary_V3.pro
./idl/qa_browse/compare/qapc_readcntlfile.pro
./idl/qa_browse/compare/qapc_scalardata.pro
./idl/qa_browse/compare/qapc_summary.pro
./idl/qa_browse/compare/qapc_vectordata.pro
./idl/qa_browse/compare/qapc_writescalarsumdata.pro
./idl/qa_browse/compare/qapcompare.pro
./idl/qa_browse/compare/qapcompare_description.txt
./idl/qa_browse/compare/sample.txt
./idl/qa_browse/compare/whattags.pro
./idl/qa_browse/compare/whattocompare.txt
./idl/qa_browse/description-files/qap_description.pro
./idl/qa_browse/description-files/qap_description.txt
./idl/qa_browse/read
./idl/qa_browse/read/gla01-fixed.txt
./idl/qa_browse/read/gla02.txt
```

./idl/qa_browse/read/qapr_readfile.pro
./idl/qa_browse/read/qapr_readqap06.pro
./idl/qa_browse/read/qapr_readqap13.pro
./idl/qa_browse/read/qapr_readqap15.pro
./idl/qa_browse/read/qapread.pro
./idl/qa_browse/util
./idl/qa_browse/util/bar_plot.pro
./idl/qa_browse/util/bar_plot2.pro
./idl/qa_browse/util/qa_colors.pro
./idl/qa_browse/util/qa_consts.pro
./idl/qa_browse/util/qab01_consts.pro
./idl/qa_browse/util/qab02_consts.pro
./idl/qa_browse/util/qab04_consts.pro
./idl/qa_browse/util/qab05_consts.pro
./idl/qa_browse/util/qab06_consts.pro
./idl/qa_browse/util/qab13and15_consts.pro
./idl/qa_browse/util/qab_errorcodes.pro
./idl/qa_browse/util/qab_translatecomponentstatus.pro
./idl/qa_browse/util/qap03_datastruct.pro
./idl/qa_browse/util/qap06V2_datastruct.pro
./idl/qa_browse/util/qap06V3_datastruct.pro
./idl/qa_browse/util/qap06V4_datastruct.pro
./idl/qa_browse/util/qap06_datastruct.pro
./idl/qa_browse/util/qap13V2_datastruct.pro
./idl/qa_browse/util/qap13V3_datastruct.pro
./idl/qa_browse/util/qap13V4_datastruct.pro
./idl/qa_browse/util/qap13_datastruct.pro
./idl/qa_browse/util/qap15V2_datastruct.pro
./idl/qa_browse/util/qap15V3_datastruct.pro
./idl/qa_browse/util/qap15V4_datastruct.pro
./idl/qa_browse/util/qap15_datastruct.pro
./idl/qa_browse/util/strprint.pro
./idl/util
./src
./src/Makefile
./src/atm_anc/A_seg_cal_cofs_mod.f90
./src/atm_anc/A_seg_cal_cofs_mod.f90
./src/atm_anc/atm_anc.f90
./src/atm_anc/makefile
./src/atm_lib/vers_atm_mod.f90
./src/atmosphere/backscat/A_cal_cofs_mod.f90
./src/common_libs
./src/common_libs/Makefile
./src/common_libs/anc_lib/anc07_glob_mod.f90
./src/common_libs/anc_lib/anc07_l1a_mod.f90
./src/common_libs/anc_lib/anc07_wf_mod.f90

./src/common_libs/anc_lib/anc07_wf_mod.f90
./src/common_libs/anc_lib/anc36_atm_mod.f90
./src/common_libs/anc_lib/anc45_meta_mod.f90
./src/common_libs/anc_lib/vers_anc_mod.f90
./src/common_libs/cntrl_lib
./src/common_libs/cntrl_lib/Makefile
./src/common_libs/cntrl_lib/compare_kval_mod.f90
./src/common_libs/cntrl_lib/gsas_toupper.f90
./src/common_libs/cntrl_lib/parse_keyval_mod.f90
./src/common_libs/cntrl_lib/vers_cntrl_mod.f90
./src/common_libs/err_lib/vers_err_mod.f90
./src/common_libs/exec_lib
./src/common_libs/exec_lib/MainInit_mod.f90
./src/common_libs/exec_lib/Makefile
./src/common_libs/exec_lib/ReadAnc_mod.f90
./src/common_libs/exec_lib/ReadData_mod.f90
./src/common_libs/exec_lib/c_nose_mod.f90
./src/common_libs/exec_lib/com_hdr_update_mod.f90
./src/common_libs/exec_lib/fCntl_mod.f90
./src/common_libs/exec_lib/fCntl_mod.f90
./src/common_libs/exec_lib/get_fileindex_mod.f90
./src/common_libs/exec_lib/pastendofperiod_mod.f90
./src/common_libs/exec_lib/set_cal_coefs_mod.f90
./src/common_libs/exec_lib/set_inst_state_mod.f90
./src/common_libs/exec_lib/vers_exec_mod.f90
./src/common_libs/file_lib/OpenFInFile_mod.f90
./src/common_libs/file_lib/OpenFOutFile_mod.f90
./src/common_libs/file_lib/vers_file_mod.f90
./src/common_libs/geo_lib/vers_geo_mod.f90
./src/common_libs/gsashdf_lib/Makefile
./src/common_libs/gsashdf_lib/close_swath_mod.f90
./src/common_libs/gsashdf_lib/const_hdfeos_mod.f90
./src/common_libs/gsashdf_lib/get_hdf_type_mod.f90
./src/common_libs/gsashdf_lib/open_swath_mod.f90
./src/common_libs/gsashdf_lib/set_hdf_invalid_mod.f90
./src/common_libs/gsashdf_lib/set_invattr_mod.f90
./src/common_libs/gsashdf_lib/write_filetable_mod.f90
./src/common_libs/gsashdf_lib/write_invmeta_mod.f90
./src/common_libs/math_lib/vers_math_mod.f90
./src/common_libs/platform_lib/const_glob_mod.f90
./src/common_libs/platform_lib/const_l1a_mod.f90
./src/common_libs/platform_lib/const_wf_mod.f90
./src/common_libs/platform_lib/const_wf_mod.f90
./src/common_libs/platform_lib/vers_platform_mod.f90
./src/common_libs/prod_lib
./src/common_libs/prod_lib/GLA00_alg_mod.f90

./src/common_libs/prod_lib/GLA00_prod_mod.f90
./src/common_libs/prod_lib/GLA00_scal_mod.f90
./src/common_libs/prod_lib/GLA01_alg_mod.f90
./src/common_libs/prod_lib/GLA01_prod_mod.f90
./src/common_libs/prod_lib/GLA01_scal_mod.f90
./src/common_libs/prod_lib/GLA04_scal_mod.f90
./src/common_libs/prod_lib/GLA05_Pass_mod.f90
./src/common_libs/prod_lib/GLA05_alg_mod.f90
./src/common_libs/prod_lib/GLA05_flags_mod.f90
./src/common_libs/prod_lib/GLA05_scal_mod.f90
./src/common_libs/prod_lib/GLA06_Pass_mod.f90
./src/common_libs/prod_lib/GLA06_alg_mod.f90
./src/common_libs/prod_lib/GLA06_scal_mod.f90
./src/common_libs/prod_lib/GLA12_alg_mod.f90
./src/common_libs/prod_lib/GLA12_scal_mod.f90
./src/common_libs/prod_lib/GLA13_alg_mod.f90
./src/common_libs/prod_lib/GLA13_scal_mod.f90
./src/common_libs/prod_lib/GLA14_alg_mod.f90
./src/common_libs/prod_lib/GLA14_scal_mod.f90
./src/common_libs/prod_lib/GLA15_alg_mod.f90
./src/common_libs/prod_lib/GLA15_scal_mod.f90
./src/common_libs/prod_lib/Makefile
./src/common_libs/prod_lib/common_flags_mod.f90
./src/common_libs/prod_lib/vers_prod_mod.f90
./src/common_libs/time_lib/vers_time_mod.f90
./src/create_gla16
./src/create_gla16/Create_GLA16.f90
./src/create_gla16/GLA16_alg_mod.f90
./src/create_gla16/GLA16_hdr_mod.f90
./src/create_gla16/Makefile
./src/create_gla16/const_gla16_mod.f90
./src/create_gla16/hdfeos5.inc
./src/create_gla16/write_gla16_atts_mod.f90
./src/create_gla16/write_gla16_defs_mod.f90
./src/create_gla16/write_gla16_meta_mod.f90
./src/create_gla16/write_gla16_vals_mod.f90
./src/elev_lib/vers_elev_mod.f90
./src/elevations/anc09_pad_mod.f90
./src/elevations/c_calcsploc_mod.f90
./src/elevations/e_calctrop_mod.f90
./src/glas_alt/ElevMgr_mod.f90
./src/glas_alt/GLAS_Alt.f90
./src/glas_alt/WFMgr_mod.f90
./src/glas_alt/WriteElev_mod.f90
./src/glas_alt/WriteWF_mod.f90
./src/glas_atm/AtmMgr_mod.f90

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./src/glas_atm/GLAS_Atm.f90
./src/glas_atm/WriteAtm_mod.f90
./src/glas_l0p/GLAS_L0proc.f90
./src/glas_l1a
./src/glas_l1a/GLAS_L1A.f90
./src/glas_l1a/L1AMgr_mod.f90
./src/glas_l1a/L1A_Granule_mod.f90
./src/glas_l1a/L1A_QAP_mod.f90
./src/glas_l1a/Makefile
./src/glas_l1a/WriteL1A_mod.f90
./src/glas_meta/GLAS_Meta.f90
./src/glas_meta/ReadMetaTemplate_mod.f90
./src/glas_meta/WriteMetaFile_mod.f90
./src/glas_reader/PrintQAP_mod.f90
./src/l1a_lib
./src/l1a_lib/L_Alt_mod.f90
./src/l1a_lib/L_Att_mod.f90
./src/l1a_lib/L_GeoLoc_mod.f90
./src/l1a_lib/L_ProcADSci_mod.f90
./src/l1a_lib/Makefile
./src/l1a_lib/vers_l1a_mod.f90
./src/qapg
./src/qapg/Makefile
./src/qapg/V_create_qa_08_mod.f90
./src/qapg/V_prod_reader_mod.f90
./src/qapg/V_read_control_mod.f90
./src/qapg/get_lun_mod.f90
./src/qapg/qapg.f90
./src/qapg/qapg_consts_mod.f90
./src/qapg/qapg_elev_mod.f90
./src/qapg/qapg_generate_mod.f90
./src/qapg/qapg_gla05_at.f90
./src/qapg/qapg_gla05_mod.f90
./src/qapg/qapg_gla05_sum.f90
./src/qapg/qapg_readgla_mod.f90
./src/qapg/qapg_specialcases_mod.f90
./src/qapg/qapg_writeqap_mod.f90
./src/waveforms/W_Assess/W_Assess_mod.f90
./src/waveforms/W_Common/QA_wf_mod.f90
./src/waveforms/W_Common/W_LsqFit_mod.f90
./src/waveforms/W_FunctionalFt/W_FunctionalFt_mod.f90
./src/waveforms/W_FunctionalFt/W_FunctionalFt_mod.f90
./src/wf_lib/vers_wf_mod.f90
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